

## The genus *Ectropis* (Geometridae, Ennominae) in Indonesia, with descriptions of two new species

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**Abstract** Eight species of *Ectropis* are recorded from Indonesia. Two new species, *E. floresensis* and *E. herbuloti*, are described from Flores Is. and Sumatra, respectively.

**Key words** Geometridae, Ennominae, *Ectropis*, taxonomic notes, new species, Indonesia.

The genus *Ectropis* Hübner has a world-wide distribution, and almost 100 species were treated as *Ectropis* in “*Geometrid Moths of the World*” by Parsons *et al.* (1999). Some of these will however be transferred to other genera in further revisional studies. I revised *Ectropis* species from Japan (Sato, 1980), Taiwan (Sato, 1986) and the Philippines (Sato, 1992), following my redefinition based on *E. crepuscularia* ([Denis & Schiffermüller]), the type species of the genus, and its relatives (Sato, 1980, 1984). In this paper, I will record eight species of *Ectropis* from Indonesia with descriptions of two new species.

Detailed notes on the localities of collecting sites in Sumatra were given by Diehl (1982, 1997), Kobes (1985, 1992) and Schintlmeister (1994).

The following acronyms are used to indicate the location of the specimens. BMNH: The Natural History Museum, London, UK. MS: Manfred Sommerer collection, Munich, Germany. NIAES: Natural Resources Inventory Center, National Institute for Agro-Environmental Sciences, Tsukuba, Japan. NSMT: National Science Museum, Tokyo. ZFMK: Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany. ZSM: Zoologische Staatssammlung, Munich, Germany.

Unless stated otherwise, all the specimens including the type material recorded in this paper will be deposited in NIAES.

### *Ectropis* Hübner

Type species: *Geometra crepuscularia* [Denis & Schiffermüller], 1775.

### *Ectropis bhurmitra* (Walker) (Figs 1, 2 & 7)

*Boarmia bhurmitra* Walker, 1860: 381.

*Boarmia diffusaria* Walker, 1860: 381.

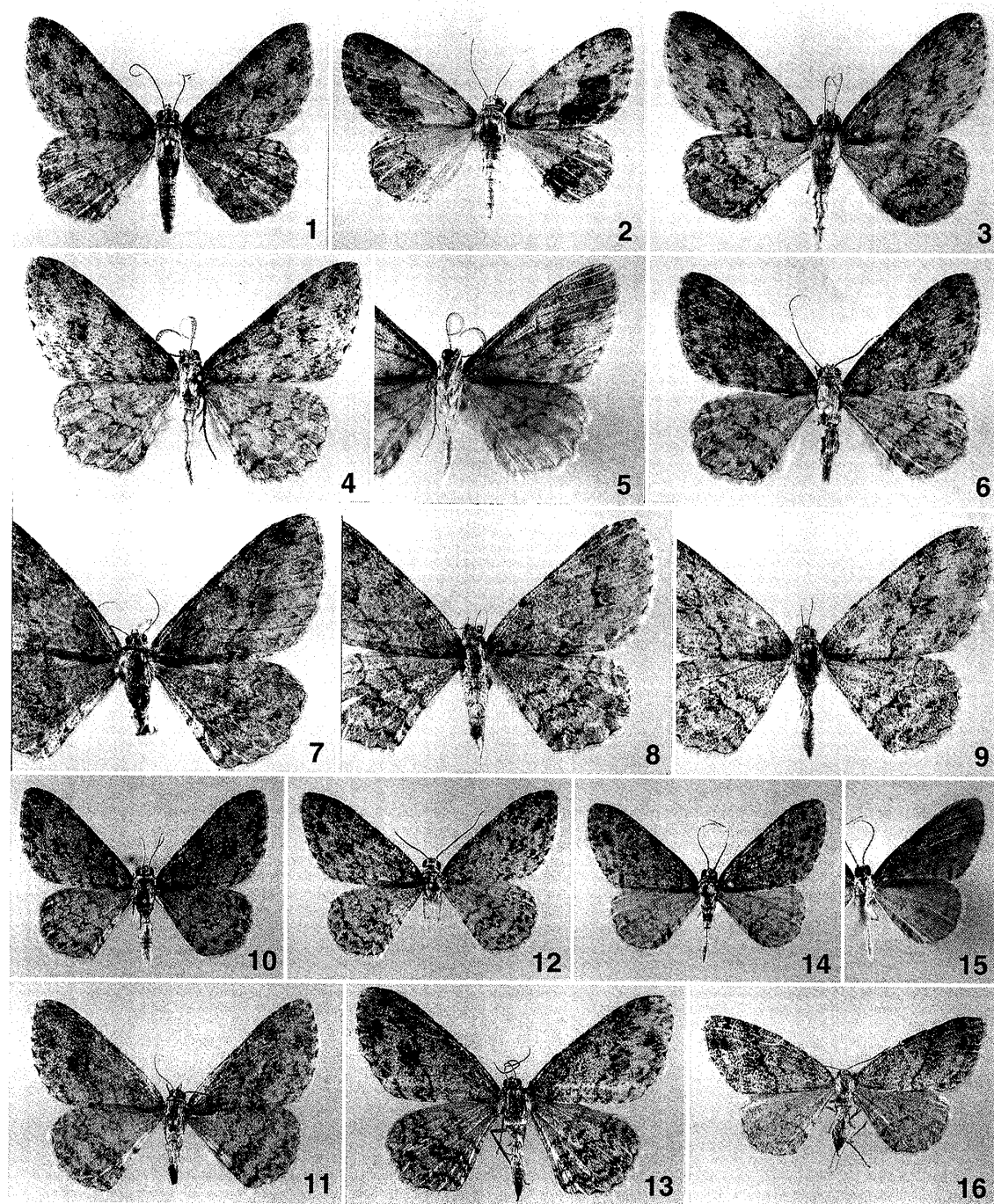
*Scioglyptis semifascia* Warren, 1897: 99.

*Ectropis sabulosa* Warren, 1897: 94.

*Heterostegane semifasciata* Warren, 1900: 111.

*Ectropis brevifasciata* Wileman, 1912: 69.

During the course of my study on *Ectropis* from the Philippines, I examined the type specimens of *bhurmitra* (Sri Lanka) and its relatives listed above, and established synonymy (Sato, 1992: 129). This species is very variable in size and maculation. A remarkable form (Fig. 2) with a large purplish brown patch between postmedial and subterminal lines on each wing can be found. The holotypes of *brevifasciata* (Taiwan), *semifascia* (Humboldt



Figs 1-16. *Ectropis* spp. 1, 2. *E. bhurmitra* (Walker). ♂, Sumatra. 3. *E. longiscapiae* Prout. ♂, Borneo. 4, 5. *E. floresensis* sp. nov. Holotype. ♂, Flores Is. 6. *E. susceptaria* Walker. ♂, Sumatra. 7. *E. bhurmitra* (Walker). ♀, Sumatra. 8. *E. longiscapiae* Prout. ♀, Borneo. 9. *E. susceptaria* Walker. ♀, Java. 10, 11. *E. pais* Prout. 10. ♂, Sumatra. 11. ♀, Sumatra. 12, 13. *E. ischnadelpha* Prout. 12. ♂, Borneo. 13. ♀, Borneo. 14-16. *E. herbuloti* sp. nov. 14, 15. Holotype. ♂, Sumatra. 16. Paratype. ♀, Sumatra.

Bay) and *semifasciata* (Buru) belong to this form.

Male genitalia (Fig. 17). Illustrated by Holloway (1994, fig. 484, Borneo) and Sato (1992, figs 16 & 17, Luzon & Punjab). Lack of cornutus is most characteristic.

Female genitalia (Fig. 25). Illustrated by Sato (1992, figs 22 & 23, Sri Lanka & Luzon).

Material examined. Many specimens taken from the following localities. Borneo. Sabah, Kundasang, Brandu Tuhan; Kota Kinabalu, Crocker Range 500–1,500 m. Sumatra. Berastagi 1,500 m; Dolok Merangir 1,800 m; SR2 400 m; Huta Padang 400 m; Dairi Mts. 1,600 m; Tele 1,600 m; Holzweg II 1,050 m; Prapat 1,150 m; Gunung Malayu 80 m; Aek Kanapan 10 m; Bukkit Subang 1,200 m. Java. Tretes, near Mt Ardjuno. Sulawesi. Nr Tondano, Mt Makaweiben 1,000 m; Palolo 700 m; Puncak Dingin; Sampuraga.

Geographical range. India, Sri Lanka, Taiwan, Philippines, Thailand, Peninsular Malaysia, Borneo, Sumatra, Java, Sulawesi, Buru, New Guinea, Solomon Is.

The mature larva was described by me based on material from Taiwan (as *E. brevifasciata*) (Sato, 1986). Holloway (1994) also gave a description of the larva according to Bell's manuscript, and mentioned that pupation is in a silken cell woven between leaves. As for all the Japanese and Taiwanese species, *Ectropis* larvae pupate on the surface of the ground without making a cocoon. The larva described by Holloway may belong to a genus other than *Ectropis*.

### ***Ectropis floresensis* sp. nov.** (Figs 4 & 5)

Male. Length of forewing 20–22 mm, wingspan 35–37mm. Easily distinguished from the other congeners in Indonesia by having doubly bipectinate antenna. Similar to *E. pectinata* Sato, 1996: 2, from Mindanao Is., the Philippines, especially in antennal structure (two pairs of pectines in each segment equal in length, densely ciliate ventrally, unscaled dorsally, one pecten extending from the basal margin and the other from near the distal margin of each segment), but different from it as follows. Male antennal pecten shorter, the longest one about three times as long as the length of the segment (four times in *pectinata*); both wings paler in colour, postmedial line straighter anteriorly, then more deeply outcurved between veins CuA<sub>1</sub> and CuA<sub>2</sub>. Almost indistinguishable from *bhurmitra* in male genitalia (see below), but third abdominal sternite without setal comb and hind tibia without hair-pencil, while in *bhurmitra* both characters are developed.

Female unknown.

Male genitalia (Fig. 18). Most similar to those of *bhurmitra* in the absence of a cornutus on the aedeagus vesica, but valva less elongate, aedeagus more slender.

Holotype. ♂. Indonesia, Prov. NTT, Flores, 9 km south of Ruteng, Golo Lusang 1,820 m, 27. ii–9. iii. 1992 (U. Paukstadt). Paratype. 1 ♂, same data as holotype.

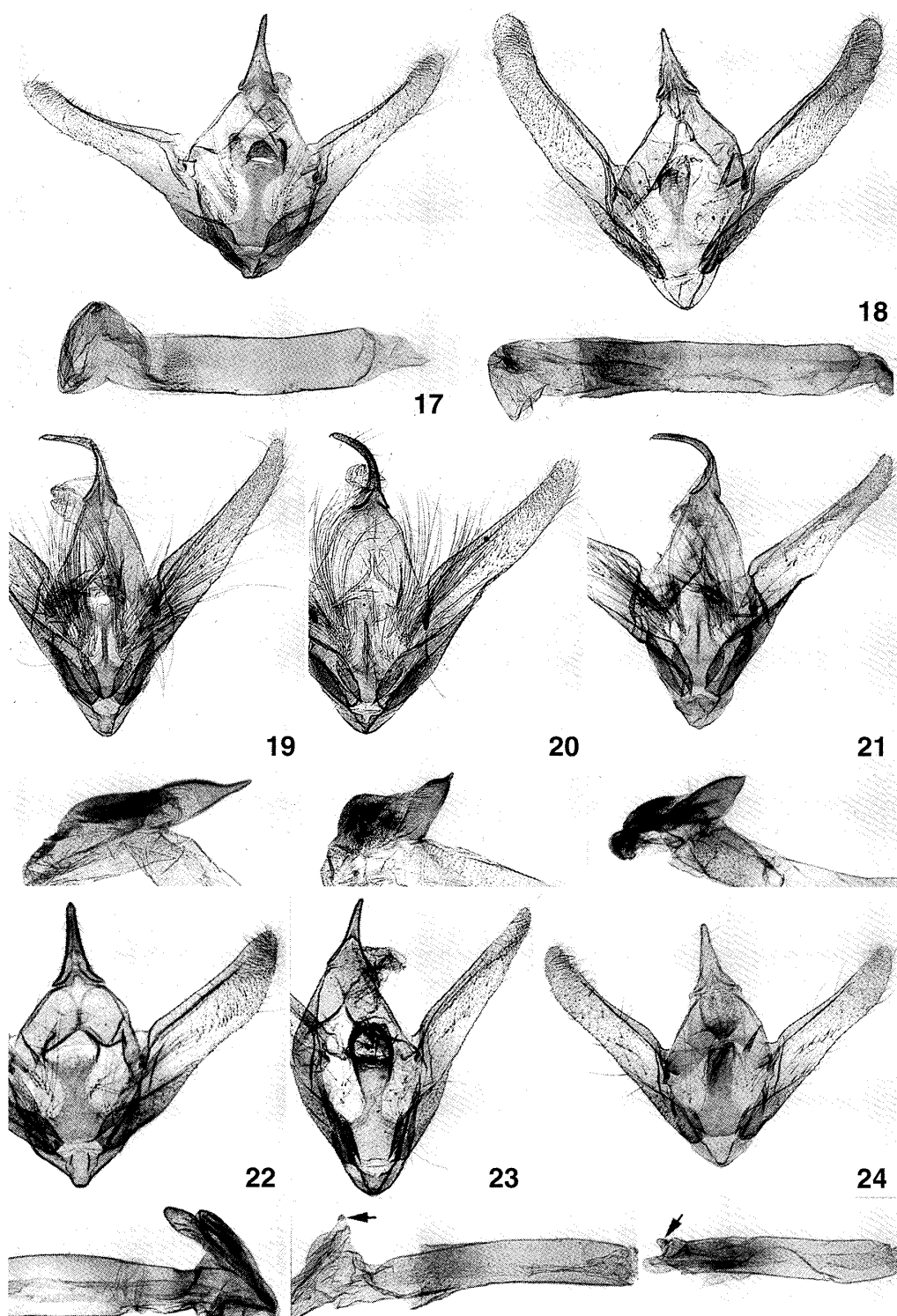
Geographical range. Flores Is.

Etymology. The specific name of this species is given after the type locality.

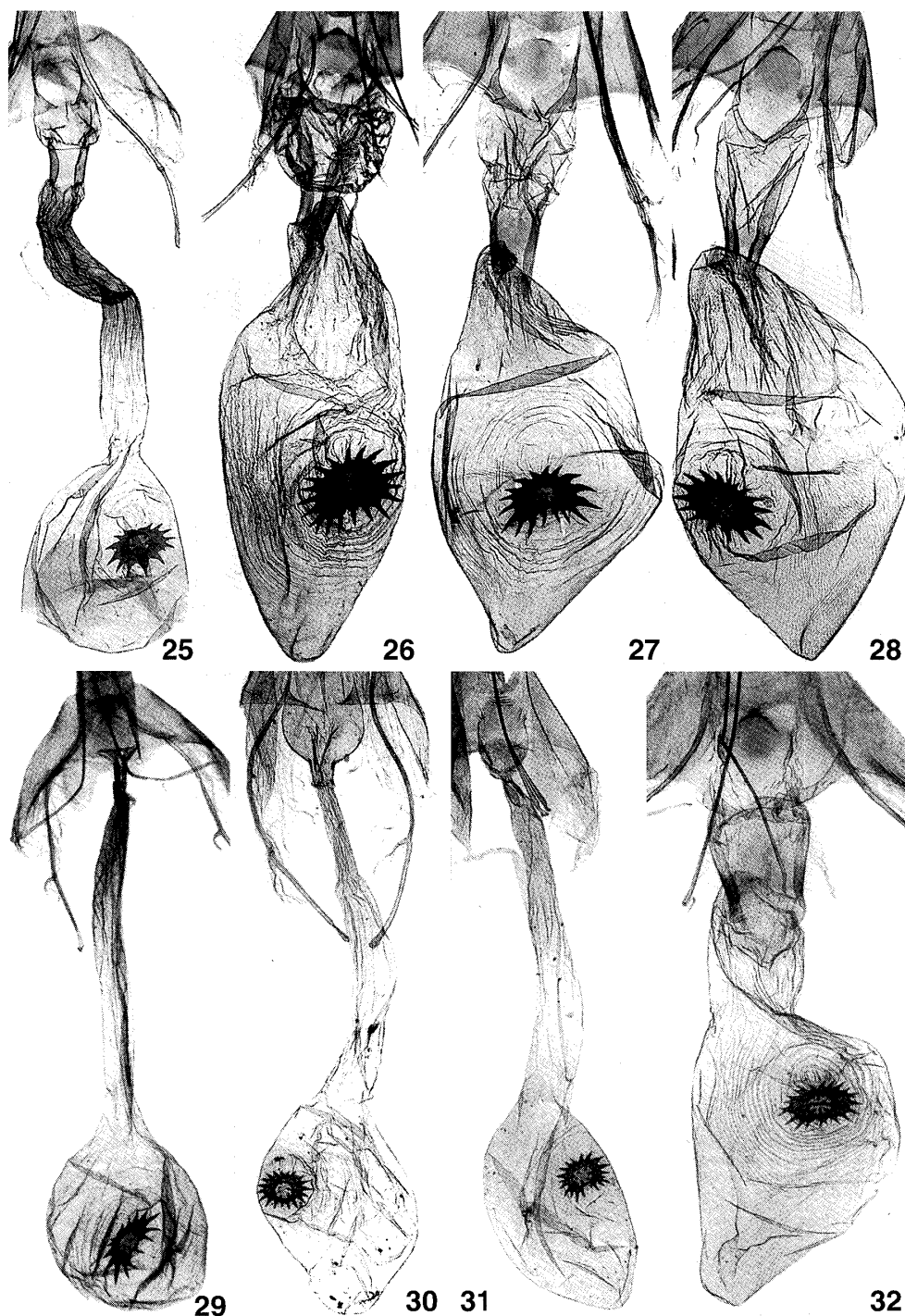
### ***Ectropis longiscapia* Prout** (Figs 3 & 8)

*Ectropis longiscapia* Prout, 1926: 199.

Very similar to *bhurmitra* in appearance, but distinguished from it as follows. In male, antennal sensilla longer, a cluster of spines on the third abdominal sternite and hair-pencil of



Figs 17-24. Male genitalia of *Ectropis* spp. 17. *E. bhurmitra* (Walker). Java. RS-6210. 18. *E. floresensis* sp. nov. Flores Is. Paratype. RS-4965. 19. *E. longiscapia* Prout. Borneo. RS-6868. 20, 21. *E. susceptaria* Walker. 20. Java. RS-6872. 21. Sumatra. RS-6864. 22. *E. pais* Prout. Sumatra. RS-3447. 23. *E. ischnadelpha* Prout (arrow: a small blind diverticulum). Borneo. RS-6878. 24. *E. herbuloti* sp. nov. Sumatra (arrow: a small blind diverticulum). Paratype. RS-4194.



Figs 25–32. Female genitalia of *Ectropis* spp. 25. *E. bhurmitra* (Walker). Java. RS-4959. 26. *E. longiscapia* Prout. Borneo. RS-6860. 27, 28. *E. susceptaria* Walker. 27. Java. RS-6861. 28. Sumatra. RS-6857. 29. *E. pais* Prout. Sumatra. RS-6873. 30. *E. ischnadelpha* Prout. Borneo. RS-4972. 31. *E. herbuloti* sp. nov. Sumatra. Paratype. RS-4186. 32. *E. brooksi* Holloway. Sumatra. RS-6867.

hind tibia lacking. In female, both wings paler, less tinged with brown.

Male genitalia (Fig. 19). Easily distinguished from those of *bhurmitra* by the presence of “a prominent cornutus in the aedeagus vesica” (Holloway, 1994: 221). Illustrated by Holloway (1994, fig. 484, Borneo).

Female genitalia (Fig. 26). Easily distinguished from those of *bhurmitra* by having “a large, convolute pouch associated with the ostium” (Holloway, 1994: 221). Illustrated by Holloway (1994, fig. 394, Borneo).

Material examined. Borneo. 2 ♂ 2 ♀, Sabah, Kota Kinabalu, Crocker Range 500–1,500 m; 1 ♂, Sabah, Mt Kinabalu, Park H.Q. 1,560 m, 8–18. xi. 1979 (T. Hasegawa).

Type material examined. Holotype. ♂. “Type H.T/ 43. 24, Mt Poi, Sarawak, 4,300–5,300 ft., 4,350 ft., Dr. E. Mjöberg/ *Ectropis longiscapia* Prout, ♂, type/ Joicey Coll. Brit. Mus. 1922-306/ Geometridae genitalia slide No. 3030”, BMNH. Genitalia checked.

Geographical range. Borneo.

### ***Ectropis susceptaria* (Walker) (Figs 6 & 9)**

*Boarmia susceptaria* Walker, 1866: 1584.

*Ectropis susceptaria*: Sato, 1992: 133.

This species was described from Java based on one female, and had been treated as a junior synonym of *bhurmitra* since Hampson (1895) until Sato (1992) recognized it as a good species. A male specimen and its genitalia are described and illustrated for the first time.

Length of forewing. ♂ 18–21 mm, ♀ 21–25 mm. Wingspan. ♂ 30–35 mm, ♀ 37–40 mm. Both wings are less tinged with yellow than in *longiscapia*, but the markings are indistinguishable from one another. The most reliable diagnostic features are found in the genitalia of both sexes, though there are slight geographical differences. Slight differences are found between the populations of Java and the other regions in the male and female genitalia, but they should be treated as geographical variation.

Male genitalia (Figs 20 & 21). Very similar to those of *longiscapia*. Juxta wider medially; aedeagus shorter, single cornutus shorter, less tapered distally. Cornutus more rounded in other populations other than the Javanese one.

Female genitalia (Figs 27 & 28). Similar to those of *longiscapia*. Ostium bursae moderately tapered anteriorly instead of having “a large convolute pouch” in *longiscapia*; colliculum much longer. Colliculum more weakly sclerotized in populations other than the Javanese one.

Material examined. Java. 40 ♂, Mt Argapura; 7 ♂ 2 ♀, G. Slamet; 4 ♂ 2 ♀, G. Muria. Sumatra. 3 ♂ 1 ♀, Berastagi 1,500 m; 1 ♀, Dairi Mts. 1,600 m; 1 ♀, Holzweg III 1,200 m; 3 ♂ 1 ♀, Holzweg II 1,050 m; 5 ♂, Prapat 1,150 m; 2 ♂ 2 ♀, Sitahoan 1,400 m; 1 ♀, Samosir; 1 ♂, Bukkit Subang 1,200 m; 1 ♀, Berastagi 1,200–1,400 m; 1 ♀, Pulau Samosir 1,500 m. P. Malaysia. 8 ♂ 2 ♀, Cameron Highlands 1,700 m; 2 ♂, Taiping, Buki Larut 1,113 m; 1 ♂, Taiping, Perak. Thailand. 3 ♂, Chiang Mai, Doi Suthep 1,100 m; 1 ♂, Chiang Mai, Doi Pui 1,400 m, Phu Phing Palace. Vietnam. 11 ♂ 2 ♀, Cao Bang, Mt Pia Oak 1,700 m; 1 ♂ 2 ♀, Vinh Phu, Tam Dao 900 m; 3 ♀, Ninh Binh Prov., Gia Vien, Cuc Phuong 230 m; 2 ♂, Tam Dao.

Type material examined. Holotype. ♀ (Sato, 1992, fig. 9), “Type/ 6-15, E.I.C.”, BMNH. Genitalia were dissected and illustrated by me (Sato, 1992, fig. 27).

Geographical range. Peninsular Malaysia, Sumatra, Java, Thailand, Vietnam. The localities other than Java are new records.

***Ectropis pais* Prout (Figs 10 & 11)**

*Ectropis pais* Prout, 1931: 166.

In my previous paper on *Ectropis* from the Philippines, I sunk *ischnadelpha* (next species) into *pais* (Sato, 1992). This taxonomic treatment was incorrect. At that time, I examined the genitalia of the holotype of *pais*, but did not dissect the holotype of *ischnadelpha*. After comparing the male genitalia of the holotypes of *pais* and *ischnadelpha*, through Sir Anthony Galsworthy's kind help, I found distinct differences between them. Therefore *ischnadelpha* should be revived as a valid species.

Holloway (1994) illustrated male genitalia under the name "*pais*" from Borneo, following my treatment (Sato, 1992), but those illustrated in fact belong to *ischnadelpha*.

This species is characterized by a sharply two-coloured frons, the upper half blackish and the lower creamy white, as mentioned in the original description (Prout, 1931). However it may be necessary in some worn specimens to examine the genitalia, which are distinct in both sexes.

Male genitalia (Fig. 22). Juxta with a pair of strings distally, vesica lightly scobinate apically with a single thumb-like cornutus. Illustrated by Sato (1992: 132, fig. 21, Mindanao).

Female genitalia (Fig. 29). Ostium bursae very short and small, ductus seminalis arising from near posterior end of ductus bursae, bursa copulatrix with a large transverse stellate signum. Illustrated by Sato (1992: 134, fig. 24, Sumatra).

Type material examined. Holotype, ♂, "Type/ Malay Penin., Kedah Peak, 3,300 ft., 14 th March, 1928/ Presented by F.M.S.Museum, B.M.1935-543/ Geometridae genitalia slide No. 15675", BMNH. Illustrated by Sato, 1992: 131, fig. 14. Genitalia checked.

Material examined. Sumatra. 1 ♂, Tele 1,600 m; 13 ♂ 19 ♀, Holzweg II 1,050 m; 3 ♂ 2 ♀, Prapat 1,150 m; 1 ♂, Pematang Siantar 350 m; 1 ♀, Sitahoan 350 m; 1 ♂, Gunung Malayu 80 m.

Geographical range. Sumatra, Peninsular Malaysia, Philippines (Mindanao).

***Ectropis ischnadelpha* Prout, sp. rev. (Figs 12 & 13)**

*Ectropis ischnadelpha* Prout, 1932: 97, pl. 10, fig. 17.

*Ectropis pais*: Holloway, 1994: 222, pl. 14, fig. 27.

Very similar to *pais*, but can be separated from it by the "non-coloured face" [frons] (Prout, 1932). The most reliable discriminating characters are found in the male and female genitalia.

Male genitalia (Fig. 23). Different from those of *pais* as follows. Valva more slender; juxta more heavily sclerotized distally with a pair of elongate sclerotized extensions; saccus narrower; vesica bearing a small blind diverticulum with a slightly sclerotized tip (Fig. 23, arrow). Illustrated by Holloway (1994, fig. 482, Borneo as *pais*).

Female genitalia (Fig. 30). Different from those of *pais* as follows. Ostium bursae rounded, much larger, ductus seminalis arising from the posterior third of ductus bursae, stellate signum smaller, not transverse.

Type material examined. Holotype, ♂, "Type/ B.N.Borneo, Mt. Kinabalu, Lumu Lumu, 5500ft., April 7 th 1929/ Presented by F.M.S.Museum, B.M. 1935-543/ Geometridae genitalia slide No. 22061", BMNH. Illustrated by Sato, 1992: 131, fig. 15. Genitalia checked.

Material examined. Borneo. Sabah, Kota Kinabalu 500–1,500 m, Crocker Range, 1 ♂, vi. 1992 (T. Hasegawa); Mt Kinabalu, Park H.Q. 1,560 m, 1 ♂, 16–21. iii. 1977 (N. Kashiwai), 2 ♀, 8–18. xi. 1979 (T. Hasegawa); Sabah, Kundasang, Mesilau 1,900 m, 1 ♀, 7. viii. 2002, 1 ♀, 24. vi. 2006 (A. Sasaki); Mesilau, Mt Kinabalu, 1 ♀, 5. i. 2005 (K. Umetsu).

Geographical range. Borneo.

Sulawesi was included in the geographical range of *ischnadelpha* by Holloway (1976). I have not yet examined any specimens of *pais* and *ischnadelpha* from Sulawesi. Therefore Sulawesi should be deleted from the geographical range of both for the present.

***Ectropis herbuloti* sp. nov.** (Figs 14, 15 & 16)

Length of forewing. ♂ 14–16 mm, ♀ 17 mm. Wingspan. ♂ 26–28 mm, ♀ 31–32 mm. Similar to *pais* and *ischnadelpha*, but distinguished from them in the following characters. Both wings slightly tinged with brown, lines less crenulate, especially postmedial line on hindwing, which is almost straight; basal area of hindwing less irrorate with fuscous.

Male genitalia (Fig. 24). More similar to those of *pais* than to those of *ischnadelpha*. Juxta wider medially, without a pair of strings; saccus not tapered distally; vesica with a small blind diverticulum as in *ischnadelpha* (Fig. 24, arrow).

Female genitalia (Fig. 31). More similar to those of *ischnadelpha* than to those of *pais*. Ostium bursae smaller than in *ischnadelpha*.

Holotype. ♂. W-Sumatra, Mt Talamau, 12 km S. Talu, 500–2,800 m, 10. ix. 1991 (Graul & A. Schintlmeister). Paratypes. N. Sumatra, Tele 1,600 m, 2 ♂, 25. iii. 1990; Dairi Mts. 1,500 m, 1 ♀, 5–6. x. 1985 (E. W. Diehl). Holzweg III 1,150 m, 1 ♂, 10–21. xi. 1983, 1 ♂ 1 ♀, 13–27. iii. 1984; Sitahoan 1,450 m, 1 ♂, 24–25. xii. 1981, 1 ♂, 8. viii. 1992, 1 ♂, 30. ix. 1992; Tele 1,600 m, 2 ♂, 3. vi. 1983, 2 ♂, 10. iii. 1984; Dairi Mts. 30 km E Sidikalang 1,800 m, 1 ♀, 31. viii. 1997 (E. W. Diehl), 1 ♂, 8–9. i. 1981 (M. Sommerer), MS. Dairi-Berge, 1 ♂, 5. v. 1972; Dolok Merangir, 1 ♂, 11. iv–16. vii. 1972 (U. Roesler & P. Küppers), ZFMK.

Geographical range. Sumatra.

Etymology. This specific name is dedicated to the late Dr Claude Herbulot, who had contributed to geometrid taxonomy and systematics for many years and passed away on January 2006.

***Ectropis brooksi* Holloway**

*Ectropis brooksi* Holloway, 1976: 79, fig. 599, pl. 26, fig. 319.

Male genitalia. Illustrated by Holloway (1994, fig. 480).

Female genitalia (Fig. 32). Illustrated here for the first time.

Material examined. Sumatra. 2 ♂, Karo Highland 900 m; 1 ♂, Gunung Malayu; 3 ♂, Holzweg III 1,200 m; 2 ♂, Holzweg IV 1,050 m; 17 ♂ 2 ♀, Holzweg II 1,050 m; 8 ♂, Prapat 1,150 m; 1 ♂, Aek Kanapan 10 m. P. Malaysia. 1 ♀, Taiping.

Geographical range. Borneo, Sumatra, Peninsular Malaysia.

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### 摘 要

2新種を含むインドネシアの*Ectropis*属(シャクガ科, エダシャク亜科)(佐藤力夫)

*Ectropis*属は広汎な分布域を持つ大属で, 世界のシャクガのカタログ(Parsons *et al.*, 1999)には, およそ100種が掲載されている。しかし, 模式種*E. crepuscularia* ([Denis & Schiffermüller]) フトフタオビエダシャクとその近縁種とは明らかに異質な種もかなり含まれており, 分類学的な再検討が必要である。

私は, これまでに, 日本, 台湾, フィリピンの*Ectropis*について報告してきたが, 本報では, インドネシアの材料について再検討した。

その結果次の8種を認め, うち2種を新種として記載した.

*E. bhurmitra* (Walker). 広く分布.

*E. floresensis* Sato (新種). Flores Is. に固有と思われる.

*E. longiscapia* Prout. Borneo 以外からは得られていない.

*E. susceptaria* (Walker). Java から1 ♀で記載された種. Sumatra, P. Malaysia, Thailand, Vietnam から初めて記録した. ♂とその交尾器を初めて図示.

*E. pais* Prout. Sumatra, P. Malaysia, Mindanao に分布.

*E. ischnadelpha* Prout. 私 (Sato, 1992) が *pais* のシノニムにしたが, ホロタイプ (♂) の交尾器を初めて確認し, 間違いであることが分かった.

*E. herbuloti* Sato (新種). Sumatra 以外からは得られていない. 2006 年1月に97歳で亡くなられたシャクガの研究者フランスの Dr Claude Herbulot に献名した.

*E. brooksi* Holloway. ♀交尾器を初めて図示した.

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